Net Zero – 2030

PPN 06/21 Carbon Reduction Plan

VERSION HISTORY

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1/03/2023	0.1	P Squire	Final for review, comments addressed
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17/05/2024	3.1	P Squire	2023 Final for Issue

Carbon Reduction Plan (CRP)

Supplier name: Ark Data Centres Limited

Publication date: May 2024

Commitment to achieving Net Zero

Ark Data Centres Limited and its subsidiary **Crown Hosting Data Centres Limited** are committed to achieving Net Zero emissions by 2030.

Ark Data Centres Limited (Ark) has been recording a subset of Scope 1 and Scope 2 emissions since 2014. These have been routinely reported as part of the company's EU ETS, Climate Change Agreement and ISO 50001 management reporting processes.

In 2020 Ark extended the scope of CO_{2e} emissions reporting to include:

- Scope 1 – All operational direct emissions.
- Scope 2 - Operational indirect emissions from purchased electricity, steam, heating and cooling.
- The following Scope 3 operational emissions:
    - Upstream transportation and distribution.
    - Waste generated in operations.
    - Business travel.
    - Employee commuting and homeworking.
    - Downstream transportation and distribution.

Due to the impact of the COVID pandemic the data was collected from 2019, rather than 2020 and therefore 2019 forms the Baseline Emissions Footprint for this Carbon Reduction Plan.

In 2023 Ark started measuring emissions from three additional Scope 3 categories:

- Purchased goods and services – water.
- Fuel- and energy-related activities (not included in Scope 1 or Scope 2).
- Upstream leased assets.

Measuring these additional categories was carried out for two main reasons:

- To assess the impact of additional categories on the current baseline plan.
- As the first step towards revising the baseline plan to include additional Scope 3 categories and additional data centre facilities when they come become operational in 2024/2025.

These three additional categories combined, currently account for ~3% of Ark's currently reported emissions. This is not considered sufficiently significant to warrant changing baseline boundaries for reporting and therefore these categories are not included in this report. This position will be reconsidered for 2024 when additional facilities become operational.

The emissions inventory reported has not undergone specific third-party assurance/verification. However, all the data within the report has been, or is in the process of being verified by third parties as follows:

a) Scope 1 energy related emissions have been/are independently verified as part of the CCA/ISO 50001 auditing processes employed by Ark.
b) Scope 2 emissions have been/are independently verified by Ark Data Centres' energy procurement advisor. All utility supplied electricity is REGO backed renewable energy. The Meridian Park campus benefits from a direct wire PPA with the London Energy Limited (LEL) energy from waste plant. The amount of renewable energy supplied from this plant varies depending on the composition of the waste supplied to fuel the plant. The emissions arising from this plant are recorded as part of Ark's Scope 2 emissions.
c) Scope 3 emissions have been compiled by EHS Projects, an external consultancy that has supported Ark to identify and collate data sources suitable for estimating scope 3 emissions. All scope 3 emissions data have been verified during emissions calculation and data production.

The greenhouse gas emissions inventory and data have been prepared following the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard, GHG Protocol Scope 2 Guidance and GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

Reference has also been made to the UK Government Environmental reporting guidelines and GHG conversions have been prepared using the UK Government conversion factors for company reporting of greenhouse gas emissions.

Baseline Emissions Footprint

Baseline emissions are a record of the greenhouse gases that have been produced in the past and were produced prior to the introduction of any strategies to reduce emissions. Baseline emissions are the reference point against which emissions reduction can be measured.

Emissions data for the baseline year 2019 and subsequent years 2020, 2021, 2022 and 2023 are presented in the following tables.

A more detailed summary table presenting the summary data by campus and source is presented in Appendix 1.

Baseline Year: 2019

Additional Details relating to the Baseline Emissions calculations.

Scope 1, operational direct emissions on Ark campuses arise from two sources:

- *Gas Oil (diesel)/Hydrotreated Vegetable Oil (HVO) for standby generators*. In a normal year, gasoil GHG emissions arise solely from the maintenance and testing of standby generators. Under normal maintenance operations, GHG emissions from the standby generators are low; however, if the backup generation was required, in an emergency, for an extended period (e.g. a long-term electricity power failure) then associated GHG emissions would accumulate rapidly due to the carbon intensity of gas oil fuel.
- F-Gas losses. These are fugitive emissions from F-Gas containing equipment such as air conditioning, caused by the unintended leakage of the refrigerant gas from the equipment. This is quantified by the amount of F-Gas refilled during equipment maintenance or replacement.

These Scope 1 emissions are reported separately in the tables below.

Scope 2, indirect emissions from purchased electricity on Ark campuses arise from two sources:

- *Utility supplied electricity*. Ark Data Centres procures 100% REGO (Renewable Energy Guarantees of Origin) certificate-backed renewable electricity from their energy supplier.
- *Direct wire Power Purchase Agreement (PPA) supplied electricity*. From 2021, Meridian Park has benefitted from a direct wire PPA for electricity from the neighbouring Energy from Waste (EfW) plant operated by London Energy. As an EfW plant, the GHG emissions intensity of the purchased electricity is dependent on and varies with its waste fuel supply, for which an annual average $kgCO_2e$ is calculated.

These Scope 2 emissions are reported separately in the tables below.

Scope 3, indirect operational emissions on Ark campuses are currently measured and reported annually from the following GHG emissions categories:

- Upstream transportation and distribution.
- Waste generated in operations.
- Business travel.
- Employee commuting and homeworking.
- Downstream transportation and distribution.

These Scope 3 emissions are reported separately in the tables below.

Baseline Emissions Reporting

2019 Baseline year emissions:	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	
Standby Generation	*126*
F-Gas	*5,134*
Scope 1 Total	**5,260**
Scope 2	
Utility Supply (market-based)	*0*
PPA Supply	*Not connected*
Utility Supply (location-based)	*33,032*
Scope 2 Total (using market-based emissions	**0**
Scope 3	
Upstream transport & distribution	*17*
Waste generated in operations	*2*
Business travel	*211*
Employee commuting and homeworking	*200*
Downstream transportation and distribution	*0*
Scope 3 Total	**430**
Total Emissions 2019 (using market-based Scope 2 emissions)	**5,690**

Reporting Year 2020 emissions:	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	
Standby Generation	*192*
F-Gas	*4,930*
Scope 1 Total	**5,122**
Scope 2	
Utility Supply (market-based)	*0*
PPA Supply	*Not connected*
Utility Supply (location-based)	*36,580*
Scope 2 Total (using market-based emissions)	**0**
Scope 3	
Upstream transport & distribution	*11*
Waste generated in operations	*2*
Business travel	*33*
Employee commuting and homeworking	*106*
Downstream transportation and distribution	*0*
Scope 3 Total	**152**
Total Emissions 2020 (using market-based Scope 2 emissions)	**5,275**

Reporting Year 2021 emissions:	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	
Standby Generation	*163*
F-Gas	*1,275*
Scope 1 Total	**1,438**
Scope 2	
Utility Supply (market-based)	*0*
PPA Supply	*143*
Utility Supply (location-based)	*38,627*
Scope 2 Total (using market-based emissions)	**143**
Scope 3	
Upstream transport & distribution	*19*
Waste generated in operations	*4*
Business travel	*40*
Employee commuting and homeworking	*152*
Downstream transportation and distribution	*0*
Scope 3 Total	**215**
Total Emissions 2021 (using market-based Scope 2 emissions)	**1,796**

Reporting Year 2022 emissions:	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	
Standby Generation	*5*
F-Gas	*1,146*
Scope 1 Total	**1,151**
Scope 2	
Utility Supply (market-based)	*0*
PPA Supply	*10*
Utility Supply (location-based)	*42,761*
Scope 2 Total (using market-based emissions)	**10**
Scope 3	
Upstream transport & distribution	*37*
Waste generated in operations	*4*
Business travel	*57*
Employee commuting and homeworking	*231*
Downstream transportation and distribution	*0*
Scope 3 Total	**329**
Total Emissions 2022 (using market-based Scope 2 emissions)	**1,490**

Current Emissions Reporting

Reporting Year 2023 emissions:	
EMISSIONS	**TOTAL (tCO_2e)**
Scope 1	
Standby Generation	*6*
F-Gas	*2,345*
Scope 1 Total	**2,351**
Scope 2	
Utility Supply (market-based)	*0*
PPA Supply	*226*
Utility Supply (location-based)	*45,601*
Scope 2 Total (using market-based emissions)	**226**
Scope 3	
Upstream transport & distribution	*7*
Waste generated in operations	*5*
Business travel	*178*
Employee commuting and homeworking	*221*
Downstream transportation and distribution	*0*
Scope 3 Total	**411**
Total Emissions 2023 (using market-based Scope 2 emissions)	**2,989**

Emissions reduction targets

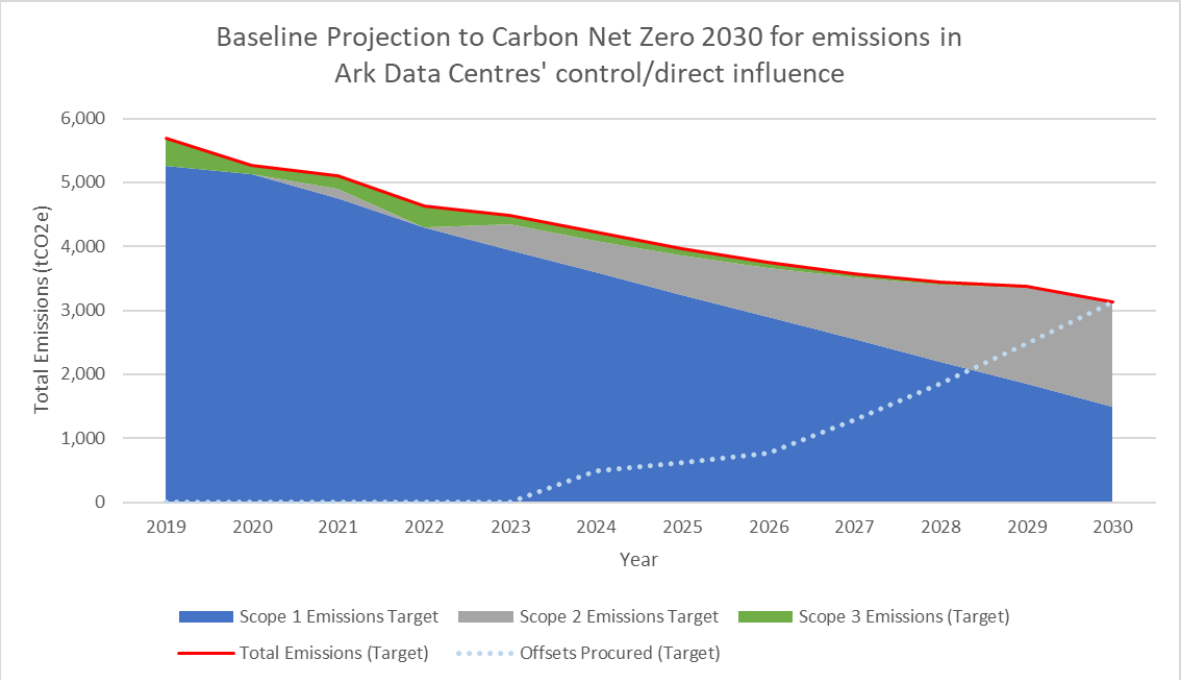
In order to continue our progress to achieving Net Zero, we have adopted the following carbon reduction targets:

- Emissions arising from Standby Generation associated with maintenance and testing to the minimum maintainable level of 16tCO_{2e}/annum by 2030.
- Fugitive emissions of F-Gas will be reduced and maintained at 1% of the installed F-Gas inventory on the Ark campuses. This equates to 1,482tCO_{2e}/annum by 2030.
- Ark will continue to procure and utilise 100% REGO backed (or equivalent) renewable energy for all utility supply contracts. This equates to 0tCO_{2e}/annum by 2030.
- Ark is not in a position to control the emissions associated with the (EfW) plant operated by London Energy at the Meridian Park Campus. These emissions will rise as the IT load in the Meridian Park facility rise. It is anticipated that this will equate to 1,638tCO_{2e}/annum by 2030. These emissions will be offset in alignment with the Oxford Principles for Net Zero Aligned Carbon Offsetting.
- Scope 3 emissions will be reduced to net zero by 2030 by:
    - Providing on campus EV charging points to encourage the use of electric vehicles for commuting and UK based business travel.
    - Where business travel results in GHG emissions (e.g. international flights) ensure that appropriate offsets are procured prior to travel.
    - Promoting the use of zero emission vehicles and transport systems in our supply chain to achieve net zero for Upstream transportation by 2030.
    - Our business generates no downstream emissions as all services to customers are carried out on campus or online.

We project that our total carbon emissions will decrease over the first nine years of the CRP to 3,574tCO_{2e} by 2027. This is a reduction of 37% of total emissions over our 2019 emissions of 5,690tCO_{2e}. By offsetting 1,288tCO2e of residual emissions in 2027, this will equate to net emissions of 2,286tCO_{2e} which represents a 60% reduction over the period.

Progress against these targets can be seen in the following charts:

Chart 1 – Baseline Projection to Carbon Net Zero 2030.



The above chart is the Baseline Projection against which progress is measured. This chart shows:

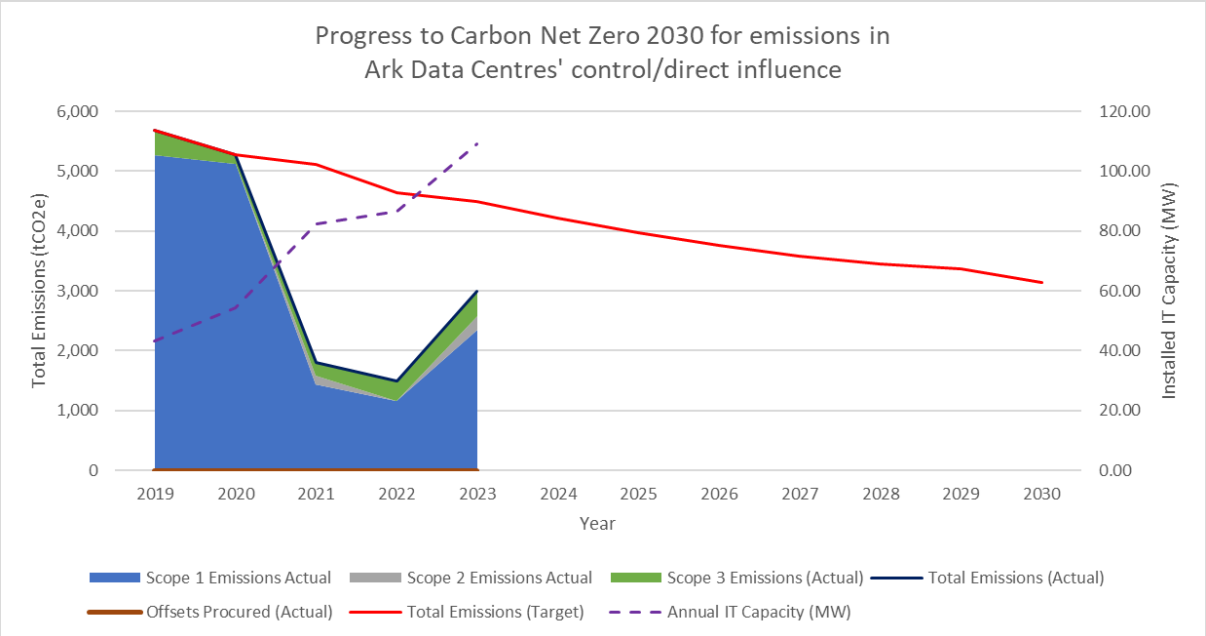
- Scope 1 emissions are the single biggest component of CO_{2e} emissions on the Ark estate. The annual reporting tables (above) show that fugitive emissions of F-Gas comprise >99% of all Ark's Scope 1 emissions and control of F-Gas losses is a major part of the CRP. The aim is to reduce Scope 1 (F-Gas) emissions from 8% of the installed volume in 2019 to 1% of the installed volume by 2030. This is a 70% reduction over the 2019 (base year) emissions and is the minimum practicable loss level from this source. These residual emissions will be offset in alignment with the Oxford Principles for Net Zero Aligned Carbon Offsetting.
- Scope 2 emissions from the EfW Plant providing energy over a direct wire PPA to the Meridian Park facility are projected to be the largest source of emissions to the Ark estate by 2023. Ark is not in a position to control the emissions associated with the (EfW) plant, these are therefore considered residual emissions and will be offset in alignment with the Oxford Principles for Net Zero Aligned Carbon Offsetting.
- The operational Scope 3 emissions currently reported on were <8% of total emissions in 2019, reducing to almost zero by 2030.

It is anticipated that by 2023/2024 the above emission sources will have been reduced to the minimum level practicable and these emissions will be offset in the future in accordance with "*The Oxford Principles for Net Zero Aligned Carbon Offsetting*":

1. Cut emissions, use high quality offsets, and regularly revise offsetting strategy as best practice evolves.
2. Shift to carbon removal offsetting.
3. Shift to long-lived storage.
4. Support the development of net zero aligned offsetting.

Emissions reduction progress

Chart 2 – Progress v Baseline Projection to Carbon Net Zero 2030.



The above Progress Chart presents actual Scope 1, Scope 2 and Scope 3 emissions against the Total Emissions Baseline Projection. It also illustrates the increase in installed IT Capacity on the Ark sites over time. The chart shows:

- Scope 1 emissions reducing significantly over the period 2021 and 2020 as a result of the remediation measures and improved F-Gas maintenance processes implemented in those years. In 2021 and 2022 F-Gas losses were <1% of installed FGas volume at that time. In 2023 FGas losses were 1.3% of installed volume; this reflects unexpected leaks at Spring Park. Notwithstanding the increase in Scope 1 emissions in 2023, relative to 2022, the actual emissions are 54% lower than the 2019 emissions and 40% lower than the 2023 target of 3,943tCO_{2e}. This is a significant improvement, particularly when considering that the data centre IT capacity has more than doubled from 43$MW_{(IT)}$ in 2019 to 109$MW_{(IT)}$ in 2023.
- Scope 2 (market based) emissions are increasing in line with IT demand from the EfW at Meridian Park.
- Scope 3 emissions returning to pre-pandemic (2019) levels as business habits return:
    - Increasing EV charge points at work have not significantly reduced employee commuting and homeworking emissions below 2019 levels. However, this lower than anticipated reduction in commuting and homeworking emissions could also be due to the fact that employee numbers have increased by 47% from 72 in 2019 to 106 in 2023.
    - Business travel emissions are returning to 2019 levels; to date no offsets have been procured for business travel.
    - Emissions arising from Upstream Transportation and Distribution appear to have fallen in 2023, however this is considered to be primarily due to a lack of accurate data from 5 of the 6 key suppliers, rather than changing behaviours.

Carbon Reduction Projects

Completed Carbon Reduction Initiatives

The following environmental management measures and projects have been completed or implemented since the 2019 baseline:

1. Replacement of single port valves with dual port valves on plant containing F-Gas, along with improved maintenance procedures over a two-year improvement programme (2020 - 2021) achieved a 75% reduction in 2022 and a 59% reduction in 2023 below the emissions from this source the 2019 baseline year. This reduced level of annual F-gas losses from equipment may not be achievable in all future years; therefore, more conservative annual F-gas loss GHG emissions have been incorporated into the carbon reduction plan as illustrated above.
2. At the end of 2021 and the beginning of 2022 Ark replaced all the diesel in the standby generation sets with HVO. This change has resulted in >95% reduction in emissions from this source over the 2019 baseline year. This reduced level of emissions from standby generation may not be achievable in all future years; therefore, a more conservative level of emissions for standby generation has been incorporated into the carbon reduction plan as illustrated above.
3. A feasibility study was carried out to replace the refrigerant (F-Gas) in older cooling plant with a newer refrigerant that has a significantly lower Global Warming Potential (GWP). Unfortunately, the study showed that although technically feasible, project was not economically viable.

The carbon emission reduction declared from these schemes in the Carbon Reduction Plan equates to a reduction in 2023 of more than 2,690tCO_{2e}, against the 2019 baseline of 5,690tCO_{2e} a reduction of 47% against the baseline target of 21% reduction by 2023.

Future Carbon Reduction Initiatives

At present Ark has a number of projects underway that could lead to further carbon reductions in future:

A. Researching alternative solutions to improve refrigerant efficiency and lower the volume of FGas inventory on site.
B. Working with customers to deploy specialised blanking elements to reduce air leakage between cold and hot zones in the facilities.
C. Optimising the temperature of standby generator casing heaters to minimise heat loss without impacting generator start times from cold.
D. Developing an initial carbon offset strategy aligned to "*The Oxford Principles for Net Zero Aligned Carbon Offsetting*" for the Scope 2 emissions generated from the Meridian Park Energy from Waste generation plant.
E. Transparently reporting our annual progress towards Carbon Net Zero in line with our CRP, GHG Protocols, SECR and CNDCP obligations.
F. New facilities are being designed without the need for significant volumes of refrigerant and where refrigerant is required that with lowest GWP is being specified.

Declaration and Sign Off

This Carbon Reduction Plan has been completed in accordance with PPN 06/21 and associated guidance and reporting standard for Carbon Reduction Plans.

Emissions have been reported and recorded in accordance with the published reporting standard for Carbon Reduction Plans and the GHG Reporting Protocol corporate standard[1] and uses the appropriate Government emission conversion factors for greenhouse gas company reporting[2].

Scope 1 and Scope 2 emissions have been reported in accordance with SECR requirements, and the required subset of Scope 3 emissions have been reported in accordance with the published reporting standard for Carbon Reduction Plans and the Corporate Value Chain (Scope 3) Standard[3].

This Carbon Reduction Plan has been reviewed and signed off by the board of directors (or equivalent management body).

Signed on behalf of the Supplier:

Andy Garvin DocuSigned by: E0F0FED811D0C40A...

Jason Liggins DocuSigned by: C00F2A237F9D409...

Date: 21 May 2024 21 May 2024

[1] https://ghgprotocol.org/corporate-standard
[2] https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
[3] https://ghgprotocol.org/standards/scope-3-standard

APPENDIX 1

GHG Emission Summary 2019 – 2023
By Campus and Source

CROWN HOSTING DATA CENTRES in partnership with Cabinet Office

Scope 1 Emissions 2019 – 2023

SCOPE 1 - Operating Emissions		2019		2020		2021		2022		2023		Commentary
Location	**Source**	**Type**	**(TCO_{2e})**	**Type**	**(TCO_{2e})**	**Type**	**(TCO_{2e})**	**Type**	**(TCO_{2e})**	**Type**	**(TCO_{2e})**	
Cody Park	Standby Generation	Gas Oil	97.6	Gas Oil	56.5	Gas Oil	52.9	HVO	2.9	HVO	4.2	Emissions from Maintenance of Standby Generators. All gas oil fuel for standby generation changed to HVO in 2022, hence reduction in CO_2e emissions.
	M&E Infrastructure	FGas	2,578.8	FGas	1,493.4	FGas	802.4	FGas	593.6	FGas	925.4	Emissions from F-gas losses during maintenance. In line with expectations following 2019-2021 maintenance works.
	Scope 1 Emissions		*2,676.4*		*1,549.9*		*855.3*		*596.5*		*929.6*	
Spring Park	Standby Generation	Gas Oil	28.3	Gas Oil	129.1	Gas Oil	49.8	HVO	1.5	HVO	1.2	Emissions from Standby Genreators and integration of new P7. All gas oil fuel for standby generation changed to HVO in 2022, hence reduction in CO_2e emissions
	M&E Infrastructure	FGas	2,555.0	FGas	3,437.0	FGas	470.1	FGas	550.2	FGas	1,396.1	Emissions from F-gas losses during maintenance. In line with expectations following 2019-2021 maintenance works.
	Scope 1 Emissions		*2,583.3*		*3,566.1*		*519.9*		*551.7*		*1,397.4*	
Meridian Park	Standby Generation	Gas Oil	NA	Gas Oil	6.6	Gas Oil	60.41	HVO	0.1	HVO	0.4	Emissions from maintenance of standby generators. All gas oil fuel for standby generation changed to HVO in 2022, hence reduction in CO_2e emissions. Limited on load run hours due to constraints imposed by utilising the Grid Connection for most of the year.
	M&E Infrastructure	FGas	NA	FGas	-	FGas	2.51	FGas	2.51	FGas	23.8	Emissions from F-Gas losses during maintenance. In line with expectations.
	Scope 1 Emissions		*NA*		*6.6*		*62.9*		*2.6*		*24.2*	
Ark	**Total Scope 1 Emissions**		**5,259.8**		**5,122.5**		**1,438.1**		**1,150.8**		**2,351.2**	

Note Emission conversion factors obtained from Government conversion factors for company reporting of greenhouse gas emissions

Government conversion factors for company reporting of greenhouse gas emissions - GOV.UK (www.gov.uk)

2019	255.6 tonnes CO2e/GWh
2020	233.1 tonnes CO2e/GWh
2021	212.3 tonnes CO2e/GWh
2022	193.4 tonnes CO2e/GWh
2023	207.1 tonnes CO2e/GWh

ARK

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Scope 2, 3 and Total Emissions 2019 – 2023

SCOPE 2 - Operating Emissions		Utility Supply 2019		Utility Supply 2020		Utility Supply 2021		Utility Supply 2022		Utility Supply 2023		Commentary
Location	**Source**	**GWh**	**(TCO_{2e})**	**GWh**	**(TCO_{2e})**	**GWh**	**(TCO_{2e})**	**GWh**	**(TCO_{2e})**	**GWh**	**(TCO_{2e})**	
Cody Park	Location Based	88.924	22,729	106.587	24,850	117.486	24,946	129.879	25,116	137.692	28,512	Meridian Park benefits from a direct wire PPA from the neighbouring Energy from Waste (EfW) plant operated by London Energy. For commercial reasons the EfW is the preferred supply, as an EfW it has Carbon Intensity that is dependent on its waste fuel supply. In 2021 this was 0.0114kgCO_{2e}/kWh. When the EfW Supply is not available Meridian Park, like Spring and Cody Park is supplied with 100% REGO Backed Renewable Energy procured from BGB on a 3 year flexible supply contract. The different supplies and associated CO_{2e} emissions for Meridian Park are reported separately in this table.
Spring Park	Location Based	40.308	10,303	47.566	11,090	58.359	12,391	64.384	12,451	66.765	13,825	
Meridian Park	PPA	NA	NA	NA	NA	12.503	143	0.845	10	19.846	226	
	Location Based	NA	NA	2.747	640	6.072	1,289	26.812	5,185	14.683	3,041	
Ark	**Total Scope 2 Location Based Emissions**	**129.231**	**33,032**	**156.900**	**36,580**	**194.421**	**38,769**	**221.920**	**42,761**	**238.987**	**45,605**	
Cody Park	Market Based	88.924	0	106.587	0	117.486	0	129.879	0	137.692	0	
Spring Park	Market Based	40.308	0	47.566	0	58.359	0	64.384	0	66.765	0	
Meridian Park	PPA	NA	NA	NA	NA	12.503	143	0.845	10	19.846	226	
	Market Based	NA	NA	2.747	0	6.072	0	26.812	0	14.683	0	
Ark	**Total Scope 2 Market Based Emissions**	**129.231**	**0**	**156.900**	**0**	**194.421**	**142.537**	**221.920**	**10**	**238.987**	**226**	

SCOPE 3 - Operating Emissions	2019		2020		2021		2022		2023		Commentary
Category		**(TCO_{2e})**		**(TCO_{2e})**		**(TCO_{2e})**		**(TCO_{2e})**		**(TCO_{2e})**	
Business Travel		211		33		40		57		178	The increases in Business Travel and Employee Commuting are due to a combination of "business as usual post COVID" and a 47% increase in staff numbers to meet the 150% increase in installed capacity over the 2019 baseline.
Employee Commuting & Homeworking		200		106		152		231		221	
Waste Generated		2		2		4		5		5	
Upstream Transportation		17		11		19		37		7	
Downstream Transportation		N/A		N/A		N/A		N/A		N/A	
Ark	**Total Scope 3 Emissions**	**430**		**152**		**215**		**329**		**411**	

Ark	**Total Scope 1, 2 & 3 Emissions (Scope 2 Market Based)**	**5,690**		**5,275**		**1,796**		**1,490**		**2,989**	